

# **AMP SUPPLY CO.**

## **LK 400/500 SERIES LINEAR AMPLIFIERS**

### **OWNER'S MANUAL**

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## SECTION 1 INTRODUCTION

### 1.1 Product Description

The Amp Supply LK 400/500 series linear power amplifiers are compact 160-15 meter MF/HF amplifiers of modern design. The series provides the amateur operator with a choice of power output levels and features consistent with their specific operating requirements. Each LK 400/500 series amplifier uses the powerful 3-500Z triode tube(s) in a grounded grid configuration Class AB<sub>2</sub>. The LK 400/500 series amplifiers are high performance pieces of equipment and are engineered conservatively with American components and ingenuity.

Every LK 400/500 series MF/HF linear amplifier is field tested at its specified power input level and duty cycle and should require a minimum of maintenance through years of operation. Additionally, each LK 400/500 series amplifier will operate many MARS frequencies without modification (see MARS expanded coverage chart). A quiet, efficient cooling system maintains the RF deck and power supply chamber temperature ensuring long service life. All LK 500 series linear amplifiers feature the new ALO (Automatic Lock Out) circuit which senses unacceptable plate/grid currents and voltages or improper amplifier tuning and stops amplifier operation.

Tuning the amplifier is a simple procedure, since each unit is designed for long-term stability in virtually any operating situation. Tuned input and standard relay switching circuitry makes the LK 400/500 series compatible with any available solid state or tube transceiver or transmitter. Despite their straight-forward design and minimal user required adjustment, the LK 400/500 series linear amplifiers are sophisticated electronic instruments. Therefore, if the unit is operated outside the parameters outlined in this owner's manual, damage may result. Please read this manual carefully before putting your new Amp Supply LK 400/500 series linear amplifier on the air.

The following definitions are applicable to this manual. These definitions must be followed explicitly. See Appendix A for a complete list of cautions and warnings.

**WARNING**  
**HAZARD PRESENTS PERSONAL INJURY OR DEATH**

**CAUTION**  
**EQUIPMENT DAMAGE MAY OCCUR BUT NOT PERSONAL INJURY**

**NOTE**  
Proper performance of the amplifier cannot be ensured if disregarded

## 1.2 Specifications

The following subsections describe the LK 400/500 series amplifiers specifications.

### 1.2.1 Common Specifications

Physical dimensions and functional characteristics of the LK 400/500 series amplifiers are contained in this listing. Specifications are subject to change without notice or obligation.

|                     |  |
|---------------------|--|
| DIMENSIONS:         | 9" H x 15" W x 15" D   |
| FREQUENCY COVERAGE: | Ham Bands 160 through 15 meters*.<br>Non-amateur frequencies between 1.8-4.0 and 6.5-24 MHz may be covered by adjustment made by a qualified electronics technician. |
| CIRCUIT TYPE:       | Class AB <sub>2</sub> grounded grid.   |
| EMISSION TYPES:     | RTTY, SSTV, AM, CW, SSB  |
| INPUT IMPEDANCE:    | 50 Ohms - tuned input for each band  |



#### LK450

TUBE COMPLEMENT: (1) 3-500Z Triode

TYPICAL OUTPUT: 1000 Watts SSB, 800 Watts CW, 600 Watts SSTV, RTTY and 300 Watts AM

PLATE VOLTAGE: RTTY, SSTV, AM, CW, SSB, 3.2 KV DC no load

DRIVE REQUIREMENTS FOR TYPICAL OUTPUT: 85 Watts PEP SSB 80 Watts CW, 50 Watts SSTV RTTY

DUTY CYCLE: Amateur continuous duty on all modes at specified output

POWER REQUIREMENTS: 117 Volts 50/60 Hz @ 20 Amps or 234 Volts 50/60 Hz @ 10 Amps, unit factory wired for 117V

WEIGHT: Shipping Net 46 lbs ; operating net 41 lbs  
Shipped in two boxes

#### LK500 Series

TUBE COMPLEMENT: (2) 3-500Z Triodes

TYPICAL OUTPUT: 1500 Watts PEP on SSB, 1200 Watts on CW 900 Watts on SSTV, RTTY and 600 Watts AM

PLATE VOLTAGE: RTTY, SSTV AM, CW, SSB 3.2 KV DC no load

DRIVE REQUIREMENTS FOR TYPICAL OUTPUT: 100 Watts PEP SSB 100 Watts CW, 60 Watts SSTV, RTTY

DUTY CYCLE: Amateur continuous duty in all modes at specified output.

POWER REQUIREMENT: 117 Volts 50/60 25 Amps or 234 Volts 50/60 Hz 12.5 Amps

WEIGHT: Shipping net 59 lbs, 2 boxes; operating net 54 lbs

AUTOMATIC LOCK OUT: Safely interrupts amplifier operation when unacceptable antenna currents and/or voltages are encountered, or when the amplifier is improperly tuned

POWER TRANSFORMER: 1.2 Amp ICAS Peter Dahl Hypersil.

#### LK550 Series

TUBE COMPLEMENT: (3) 3-500Z triodes

TYPICAL OUTPUT: 1500 Watts SSB, CW, SSTV, RTTY, 900 Watts AM

PLATE VOLTAGE: RTTY, SSTV, AM, CW, SSB 3.2 KV DC no load

DRIVE REQUIREMENTS FOR TYPICAL OUTPUT: 100 Watts all modes

DUTY CYCLE: Continuous duty all modes at specified output, 24 hours a day

POWER REQUIREMENTS: 234 Volts 50/60 Hz 25 Amps only

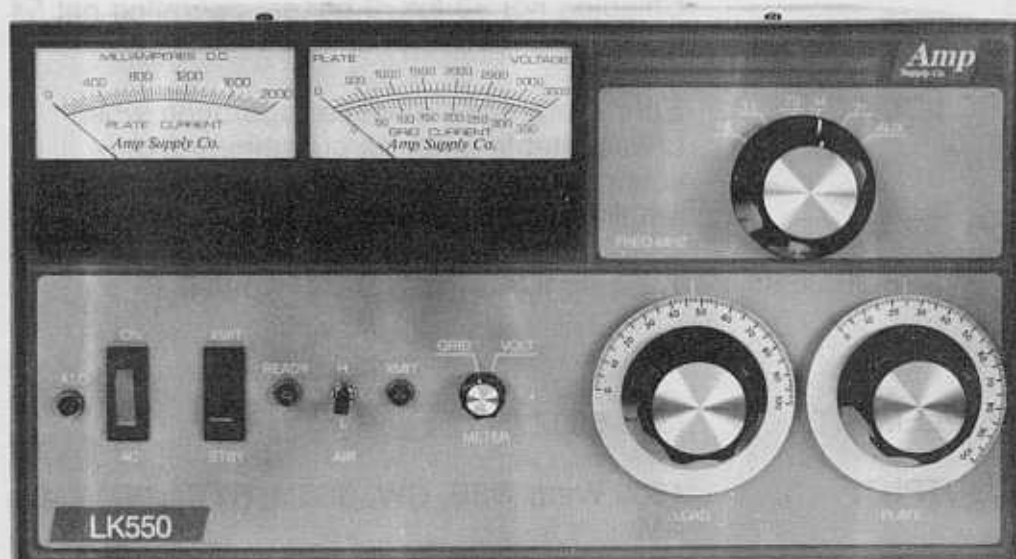
WEIGHT: Shipping Net 110 lbs; 3 boxes Operating Net 103 lbs; RF Deck 38 lbs; transformer 65 lbs; tubes 7 lbs.

AUTOMATIC LOCK OUT: Safely interrupts amplifier operation when unacceptable antenna currents and/or voltages are encountered, or when the amplifier is improperly tuned.

POWER TRANSFORMER: 1.75 Amp CCS Peter Dahl Hypersil in separate enclosure.



### 1.3 Front Panel Features



**AC-ON Illuminated ROCKER SWITCH** - Turns power on and off.

**XMIT-STBY ROCKER SWITCH** - Turns the amp from Standby to Operate mode. Operate mode enables a green LED.

**BAND-SWITCH** - Selects desired band.

**HI/LO AIR SWITCH** - Provides higher volume cooling air for extended operation.

**XMIT - Red LED**

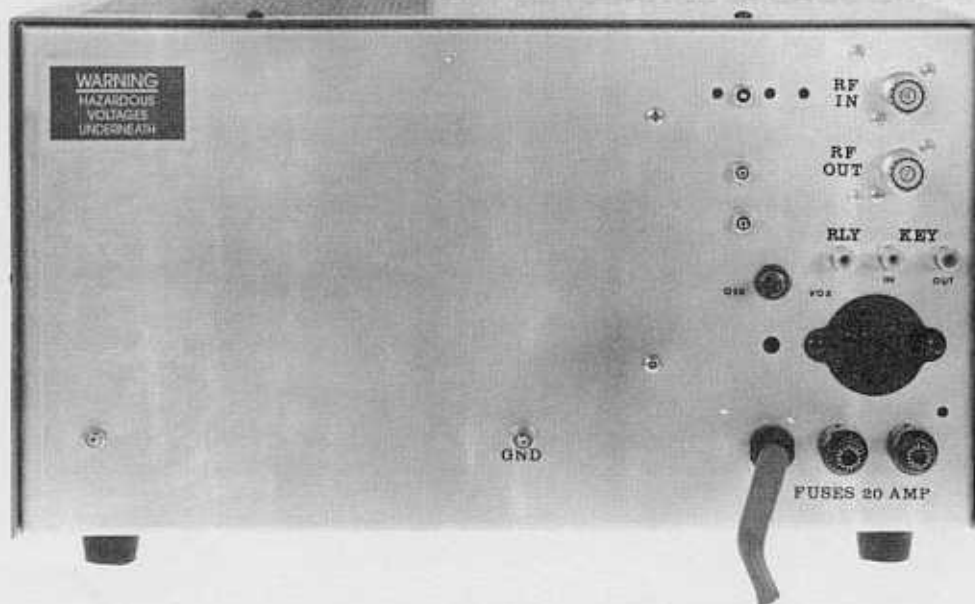
**PLATE AND LOAD KNOBS** - Tuning adjusts Pi-Network capacitors in tank circuit for proper resonance and loading on all bands.

**PLATE CURRENT METER** - Continuously monitors plate current of 3-500Z tube(s).

**GRID-VOLT METER** - By use of the meter switch can monitor plate volts (0-3500 V) or grid current (0-350 mA).

**ALO LED** - Enabled when unacceptable plate/grid currents and/or voltages are encountered or improper amplifier tuning exists .

## 1.4 Rear Apron Features



RF-IN - For connecting to exciter RF output to the amplifier.

RF-OUT - For connecting the LK400/500 series linear amplifier to an antenna.

RLY - For connecting to exciter auxiliary jack to activate T/R Relay in the LK400/500 series amplifiers.

KEY IN - QSK ONLY - station key, must be a bug, hand key or a keyer

KEY OUT - QSK ONLY - hooks to the KEY-IN jack on a QSK transceiver.

QSK VOX SWITCH - place in the QSK position when operating QSK CW.

GROUND LUG - Attach to a good earth ground.

FUSES - 2 holders provided to protect each leg of the AC line.

SERIAL NUMBER - Located on the model type identification sticker.

AC LINE CORD - Connect to proper power requirements only.

PAC-5 PLUG - LK550/LK500 w/optional PAC-5 only. Connects the PAC-5 power transformer to LK550/LK500.

## CAUTION

NEVER REMOVE /INSERT PLUG WHEN UNIT IS ON OR WHEN THE RF  
DECK AC LINE CORD IS CONNECTED TO AN AC POWER SOURCE



RF-IN - For connecting to external RF output to the amplifier.  
RF-OUT - For connecting the LK400/500 series linear amplifier to an antenna.  
RT-Y - For connecting to external auxiliary jack to activate TFF Relay in the LK400/500 series amplifier.  
KEY-IN - QSK ONLY - station key, must be a bug, hand key or a keyer.  
KEY-OUT - QSK ONLY - jacks to the KEY-IN jack on a QSK transceiver.  
QSK VOX SWITCH - place in the QSK position when operating QSK CW.  
GROUND LUG - Always a good earth ground.  
FUSES - 2 holders provided to protect each leg of the AC line.  
SERIAL NUMBER - Located on the model type identification sticker.  
AC LINE CORD - Connect to proper power requirements only.  
PAC-5 PLUG - LK850/LK500 optional PAC-5 only. Connects the PAC-5 power transformer to LK500/LK850.

## SECTION 2 INSTALLATION

### 2.1 Introduction

This section describes the unpacking and installation procedures for the LK 400/500 series amplifiers.

#### **WARNING**

**MAKE NO ATTEMPT TO PUT THE AMPLIFIER IN SERVICE  
OUTSIDE OF THE CABINET—CONTACT WITH VOLTAGE  
IN THE AMPLIFIER CAN BE FATAL!!!**

### 2.2 Unpacking

All shipping containers have been specially designed to protect their contents and special care has been taken to prevent damage under normal shipping conditions. Mishandling should be evident upon inspection of the shipping container. If damage is found after visual inspection, take care not to destroy the evidence. If necessary, document the damage with photographs and contact the transport carrier immediately.

Carefully remove your new LK400/500 series linear amplifier from its packing carton, and examine it closely for signs of shipping damage. It is recommended to save all original packing cartons to protect your amplifier from damage should you wish to store it or ship it for after-sales service.

### 2.3 Warranty Card

Fill out the enclosed warranty registration card and return to Amp Supply within 10 days of original purchase. Keep your original sales slip with the packing cartons should you ever need it for reference.

### 2.4 Installation

The following subsections describe the installation procedures for the LK 400/500 series amplifiers.

## 2.4.1 Tube Installation

### CAUTION

**ENSURE TUBES ARE INSTALLED PRIOR TO  
APPLYING POWER TO THE AMPLIFIER**

Carefully remove the tubes from their boxes. Carefully move the parasitic chokes in the tube compartment out of the way and install tubes. When securing the plate cap(s), take care not to overtighten screws or tube(s) may be damaged. Remove packing from under the tuned input board.

## 2.5 Amplifier Placement

In general, the location of your new amplifier is not critical. However, certain precautions must be taken to ensure optimum performance. Avoid extremely hot locations such as near radiators or other heating units. Keep the top of the amplifier case clear of books, papers, or other equipment to protect against overheating. Do not place the amplifiers closer than 2-1/2 inches from a wall.

### CAUTION

**OBSTRUCTION OF THE SIDES OF THE AMPLIFIER CASE  
AND THE BLOWER AIR INLET MAY RESULT IN  
AMPLIFIER TUBE(S) OVERHEATING**

## 2.6 Power Requirements

Refer to your amplifier series unique specifications for proper power requirements and Figure 2.6.1 for AC line hook-up.

### WARNING

**NEVER OPERATE ANY AMPLIFIER  
USING AN EXTENSION CORD**

The LK400/500 series is shipped from the factory with jumpers connected to operate on 234 VAC (except LK 450). It is highly recommended that your



amplifier be operated from its own 334 V - 20 A (or greater) circuit. If a 117 V supply is available, it should be fused for 30 A with circuit conductors not less than #10. No other equipment should be operated from this 117 V circuit. A jumper plug is provided with the amplifier to convert to 117 V service.

## WARNING

COMPLETELY REMOVE POWER FROM YOUR AMPLIFIER AND ALLOW 30 MINUTES FOR THE HIGH VOLTAGE CAPACITORS TO DISCHARGE THROUGH ALL LEAD RESISTORS BEFORE ATTEMPTING TO CHANGE JUMPER CONNECTIONS ON BACK OF AMPLIFIER.

Figure 2.6.5 illustrates the jumper connection on the Power Distribution Board located in the rear of the chassis for either 117V and 234V operation. The jumper must be removed or moved to the correct position for the correct voltage.

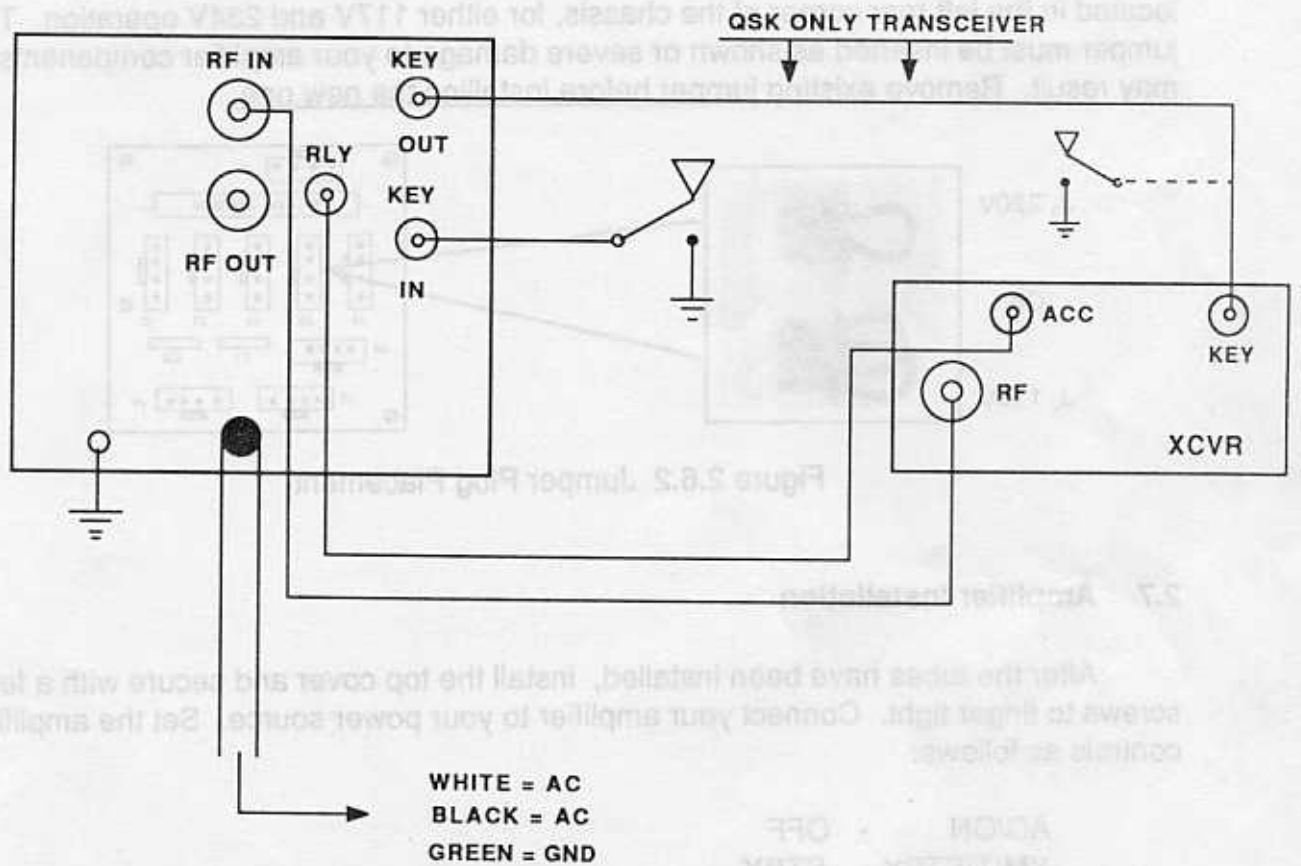


FIGURE 2.6.1 AC Line Hook-Up



amplifier be operated from its own 234 V - 20 A (or greater) circuit. If a 117 V circuit is all that is available, it should be fused for 30 A with circuit conductors not less than #10. No other equipment should be operated from this 117V circuit. A jumper plug is provided with the amplifier to convert to 117V service.

## WARNING

**COMPLETELY REMOVE POWER FROM YOUR AMPLIFIER  
AND ALLOW 30 MINUTES FOR THE HIGH VOLTAGE CAPACITORS  
TO DISCHARGE THROUGH BLEEDER RESISTORS  
BEFORE ATTEMPTING TO CHANGE JUMPER CONNECTIONS  
ON BACK OF AMPLIFIER.**

Figures 2.6.2 illustrates the jumper connection on the Power Distribution Board, located in the left rear corner of the chassis, for either 117V and 234V operation. The jumper must be inserted as shown or severe damage to your amplifier components may result. Remove existing jumper before installing the new one.

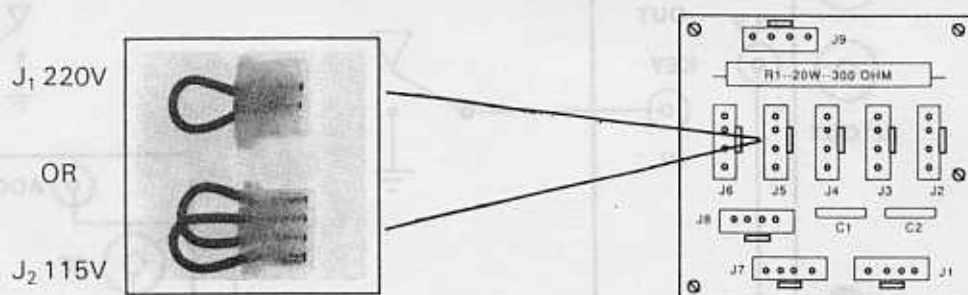


Figure 2.6.2 Jumper Plug Placement

## 2.7 Amplifier Installation

After the tubes have been installed, install the top cover and secure with a few screws to finger tight. Connect your amplifier to your power source. Set the amplifier controls as follows:

AC/ON - OFF  
XMIT/STBY - STBY  
METER - VOLTS

Turn the unit on. Plate voltage should read between 3000-3300 Volts DC.  
Turn the unit off.

## **2.8 Cable Installation** (See Figure 2.8.1)

- a. Using a 6 ft. length, connect a 52-Ohm coaxial cable (RG-8U or equivalent) between your transmitter's RF OUTPUT to the LK400/500 series RF INPUT connector.
- b. Using another short length of coaxial cable, (RG-8U or equivalent,) connect the LK400/500 series RF OUTPUT connector to a suitable wattmeter.
- c. Using the necessary length of coaxial cable, (RG-8U or equivalent) connect the wattmeter output to your antenna system.
- d. Select an appropriate length of shielded cable and install an RCA connector on one end and the appropriate connector for your transceiver at the other end.
- e. Install the shielded cable between your transmitter accessory contacts on the transmitter rear apron and the RLY plug on the rear apron of your LK400/500 series linear amplifier. These should be normally open contacts capable of carrying 100 mA, which close when you desire to transmit.
- f. See your exciter operators manual for details.

## **2.9 Ground Requirements**

For best results your amplifier should be attached to a good earth ground by as short in length, and as large as possible, ground strap. A ground post is provided on the rear apron for this purpose. It is always a good idea to connect the chassis of all associated equipment together and ground them at one point to avoid ground loops. We recommend that all of the equipment in your station be connected together and grounded at the antenna tuner.

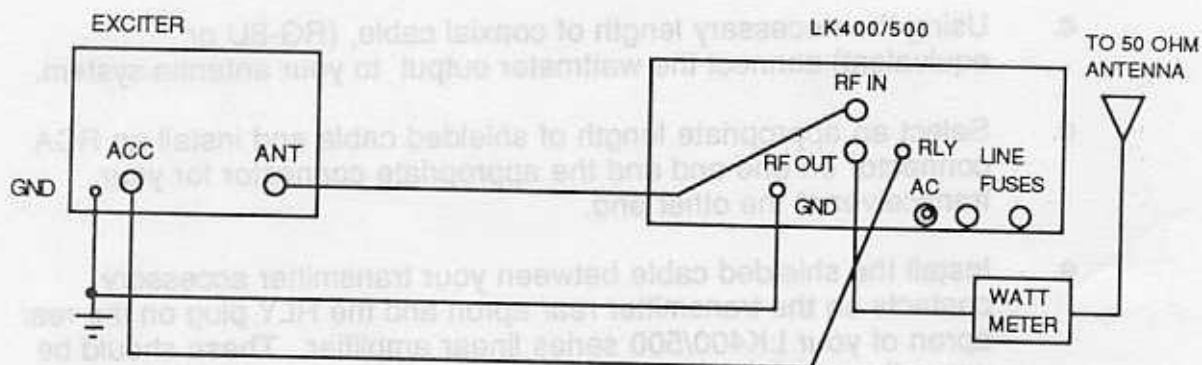


Figure 2.8.1 Cable Installation

## SECTION 3 TUNING

### 3.1 Tuning Procedure

This section describes the tuning procedure for the LK400/500 series linear amplifiers. Follow all steps carefully to insure optimum performance of your amplifier. Read all tuning steps before actually tuning your amplifier.

#### CAUTION

THIS UNIT IS SHIPPED READY FOR 234 VAC OPERATION (EXCEPT LK450). REFER TO INSTALLATION INSTRUCTIONS FOR 117V OPERATION.

1. Set the BANDSWITCH to the desired band. If your amplifier is model LK450/500/550NTC, go to step 4, otherwise proceed on to step 2.
2. Set the LOAD control on number shown on Tuning Chart.
3. Set the PLATE control on number shown on Tuning Chart.
4. Set the ON/AC control to ON.
5. Select the correct antenna for the band selected. Insure antenna VSWR is acceptable before proceeding.
6. Set the XMIT/STBY control to XMIT. The green LED indicates the amplifier is in the Ready To Operate mode. If your amplifier is model LK500NTC, go to step 7, otherwise proceed to step 8.
7. Set Meter switch to grid current (this is read on Plate Voltage/Grid Current Meter).
8. Insert a small amount of exciter drive until the plate current begins to rise to approximately 400mA. If your amplifier is model LK450/500/550NTC, go to step 16, otherwise proceed to step 9.

9. Rotate the PLATE control for maximum output on your station watt meter.
10. Alternate between PLATE and LOAD for maximum output.  
1 KW input (Plate Voltage x Plate Current = Power Input)  
Example: Plate Current = 400mA  
Plate Voltage = 2500 VDC  
.4 x 2500 V = 1000 Watts Input
11. Increase drive power. Repeat steps 8 through 10 until you obtain maximum power output.
12. During tune up alternately monitor Grid and Plate Current.
13. Grid current can be reduced by slightly decreasing the Load control. Turn control to right, clockwise.
14. ALWAYS TUNE FOR MAXIMUM OUTPUT!
15. Increase drive from the exciter until a further increase in exciter drive does not increase amplifier output power.

16. SPECIAL INSTRUCTIONS — ALL NO-TUNE MODELS

Rotate FINE control to achieve peak amplifier output.

Rotate QSK control ON to enable QSK mode if desired.

17. When your station wattmeter indicates maximum amplifier power output, return the exciter to receive mode. Select desired transmitter or transceiver operating mode, and you are now ready to operate.



**Table 3-1  
Tuning Charts**

Each amplifier is supplied with a special Tuning Chart, filled out during the Final Test and Quality Control. This Chart gives PLATE and LOAD settings for actual operation of your amplifier into a 50 ohm load, using popular mid-band frequencies on each Amateur band. These settings will vary according to your favorite operating frequencies. **USE THESE PLATE AND LOAD SETTINGS AS A GUIDE WHEN TUNING YOUR NEW AMPLIFIER FOR THE FIRST TIME, ACCORDING TO THE TUNING PROCEDURE ON PAGE 16.**

No-Tune Models have been pre-tuned at the factory for mid phone-band frequencies. The FINE control is used to peak amplifier tuning on other portions of each band. See Step 17 in Tuning Procedure.

### CAUTION

#### OBSERVE CURRENT LIMITATIONS FOR NORMAL OPERATION

|                   | LK450 | LK500 | LK550 |
|-------------------|-------|-------|-------|
| Plate Voltage     | 3150  | 3150  | 3150  |
| Plate Current, mA | 550   | 950   | 1400  |
| Grid Current, mA  | 150   | 300   | 400   |



## TUNE-UP NOTES

4.1 Introduction  
This section provides instructions on the care and cleaning of the LK 400500  
series amplifier.

### WARNING

EXTREME CARE MUST BE TAKEN WHENEVER MAKING  
ANY ADJUSTMENTS INSIDE ANY LINEAR AMPLIFIER

### 4.2 Cleaning Amplifier Compartment

After completely disconnecting your amplifier from the power source, wait 30  
minutes so all electrolytic capacitors have discharged through their bleed resistors.  
The top cover can then be safely removed by taking out the top and side row of  
screws.

Since the amplifier compartment is forced air cooled, it will collect particles of  
dust which must be periodically removed. The frequency of cleaning will be governed  
by how many hours the amplifier is operated, and by operating environment cleanliness.  
When the blower blades accumulate a large amount of dust, the amplifier should  
be cleaned. The best way to clean the amplifier is to remove the top cover and blow  
the dust out with compressed air. If compressed air is not available, a soft-bristled one-  
inch point brush can be used to brush the amplifier clean.

### CAUTION

DO NOT BLOW AIR DIRECTLY INTO THE FAN BLADES.  
USE A BRUSH IN CLEANING THE BLADES OF THE FAN.

### 4.3 Tube Replacement

If it becomes necessary to replace the tubes in the amplifier the same brand  
should be used. A new tube kit is available from Amp Supply Co.

## **SECTION 4 AMPLIFIER CARE**

### **4.1 Introduction**

This section provides instructions on the care and cleaning of the LK 400/500 series amplifiers.

### **WARNING**

**EXTREME CARE MUST BE TAKEN WHENEVER MAKING  
ANY ADJUSTMENTS INSIDE ANY LINEAR AMPLIFIER**

### **4.2 Cleaning Amplifier Compartment**

After completely disconnecting your amplifier from the power source, wait 30 minutes so all electrolytic capacitors have discharged through their bleeder resistors. The top cover can then be safely removed by taking out the top and side row of screws.

Since the amplifier compartment is forced-air cooled, it will collect particles of dust which must be periodically removed. The frequency of cleaning will be governed by how many hours the amplifier is operated, and by operating environment cleanliness. When the blower blade accumulates a large amount of dust, the amplifier should be cleaned. The best way to clean the amplifier is to remove the top cover and blow the dust out with compressed air. If compressed air is not available, a soft-bristled one-inch paint brush can be used to brush the amplifier clean.

### **CAUTION**

**DO NOT BLOW AIR DIRECTLY INTO THE FAN BLADES.  
USE A BRUSH IN CLEANING THE BLADES OF THE FAN**

### **4.3 Tube Replacement**

If it becomes necessary to replace the tubes in the amplifier the same brand should be used. A new tube kit is available from Amp Supply Co.

**Table 4-2**  
**TROUBLE SHOOTING CHART (CONT'D)**

| <b>SYMPTOM</b>                    | <b>CASE</b>                    | <b>REMEDY</b>  |
|-----------------------------------|--------------------------------|--|
| Amplifier always in transmit mode | Relay Control cable is shorted | Check center to shield for continuity: Re-do Relay Control cable               |
| Amp will not load                 |                                | Check Bandswitch setting<br>Wrong antenna selected<br>XMIT/STBY switch in STBY |

## LIMITED WARRANTY

Amp Supply Company warrants to the original purchaser that this product shall be free from defects in material (except tubes and RF output transistors) or workmanship for two (2) years from the date of original purchase.

During the warranty period, the Amp Supply Company or an authorized Amp Supply Company service facility will provide free of charge both parts (except tubes and RF output transistors) and labor necessary to correct defects in material or workmanship.

To obtain such warranty service, the original purchaser must:

- (1) Complete and send in the Warranty Registration Card.
- (2) Notify Amp Supply Company or its nearest authorized service facility, as soon as possible after discovery of a possible defect, of:
  - (a) The model number and serial number, if any;
  - (b) The identity of the seller and the approximate date of purchase;
  - (c) A detailed description of the problem, including details on the electrical connection in associated equipment and the list of such equipment.
- (3) Deliver the product to the Amp Supply Company or the nearest authorized service facility, or ship the same in its original container or equivalent, fully insured and shipping charges prepaid.

Correct maintenance, repair and use are important to obtain proper performance from this product. Therefore, carefully read the Instruction Manual. This warranty does not apply to any defect that Amp Supply Company determines is due to:

- (1) Improper maintenance or repair, including the installation of parts or accessories that do not conform to the quality and specifications of the original parts.
- (2) Misuse, abuse, neglect or improper installation.
- (3) Accidental or intentional damage. All implied warranties, if any, terminate one (1) year from the date of the original purchase.

The foregoing constitutes Amp Supply Company's entire obligation with respect to this product, and the original purchaser and any user or owner shall have no other claim for incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This warranty gives specific legal rights and you may also have other rights which vary from state to state.

## WARNINGS

MAKE NO ATTEMPT TO PUT THE AMPLIFIER IN SERVICE OUTSIDE OF THE CABINET. CONTACT WITH HIGH VOLTAGES FOUND IN THE AMPLIFIER CAN BE FATAL.

NEVER OPERATE ANY AMPLIFIER FROM AN EXTENSION CORD.

COMPLETELY REMOVE POWER FROM YOUR AMPLIFIER AND ALLOW 30 MINUTES FOR THE HIGH VOLTAGE CAPACITORS TO DISCHARGE THROUGH BLEEDER RESISTORS BEFORE ATTEMPTING TO CHANGE JUMPER CONNECTIONS IN BACK OF AMPLIFIER.

## CAUTIONS

NEVER REMOVE/INSERT PLUG WHEN UNIT IS ON OR WHEN THE RF DECK AC LINE CORD IS CONNECTED TO AN AC POWER SOURCE.

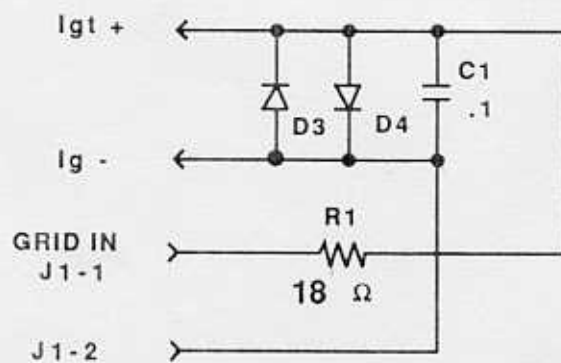
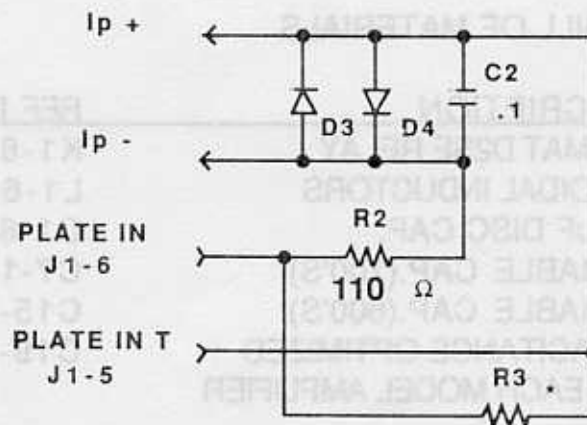
ENSURE TUBES ARE INSTALLED PRIOR TO APPLYING POWER TO THE AMPLIFIER.

OBSTRUCTION OF THE SIDES OF THE AMPLIFIER/CASE AND THE BLOWER AIR INLET MAY RESULT IN AMPLIFIER TUBE(S) OVERHEATING.

THE UNIT IS SHIPPED READY FOR 234VAC OPERATION. REFER TO INSTALLATION INSTRUCTIONS FOR 117V OPERATION.

OBSERVE CURRENT LIMITATIONS FOR NORMAL OPERATION.

DO NOT BLOW AIR DIRECTLY INTO FAN BLADES. USE A BRUSH FOR CLEANING THE BLADES.



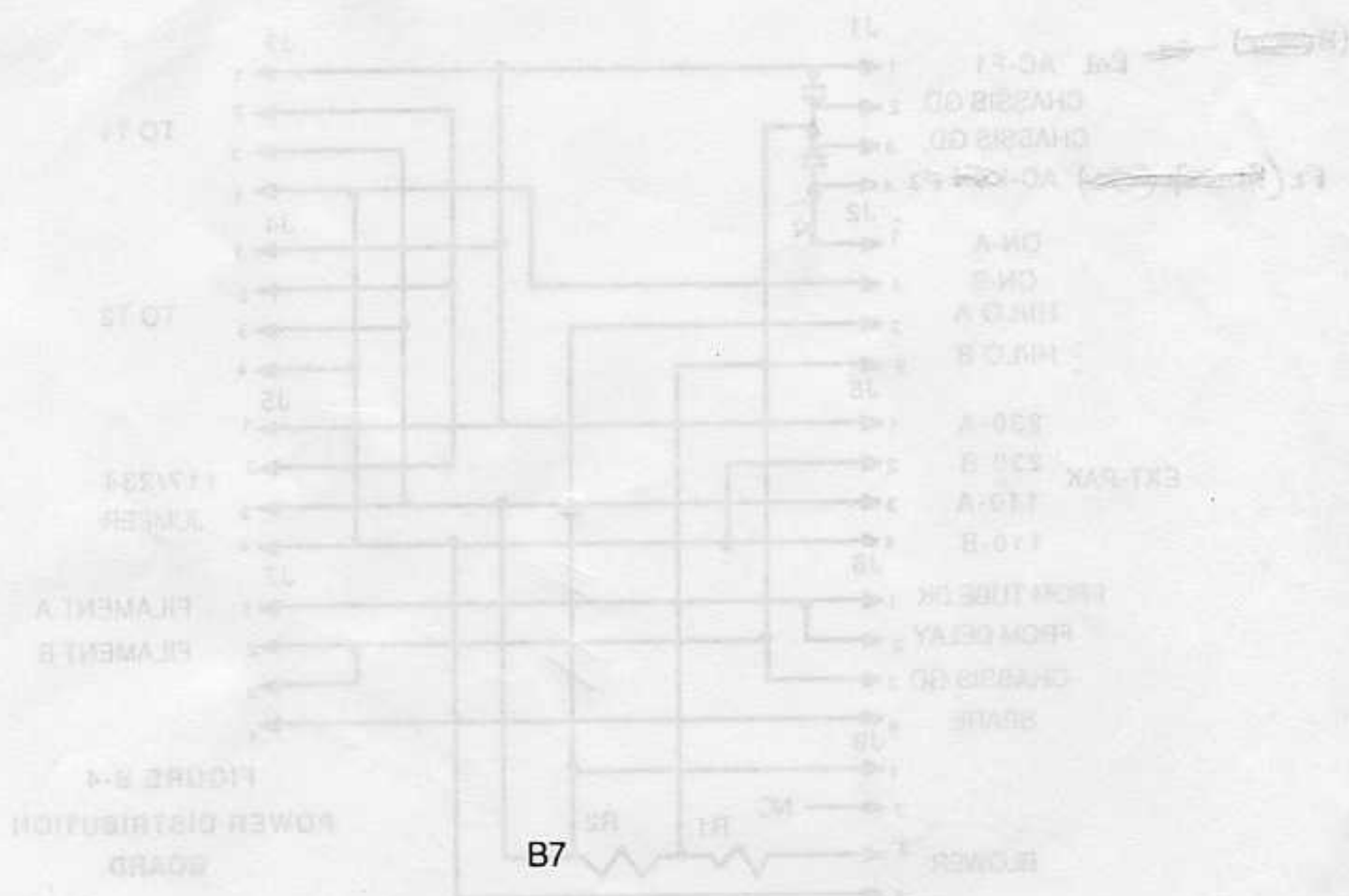
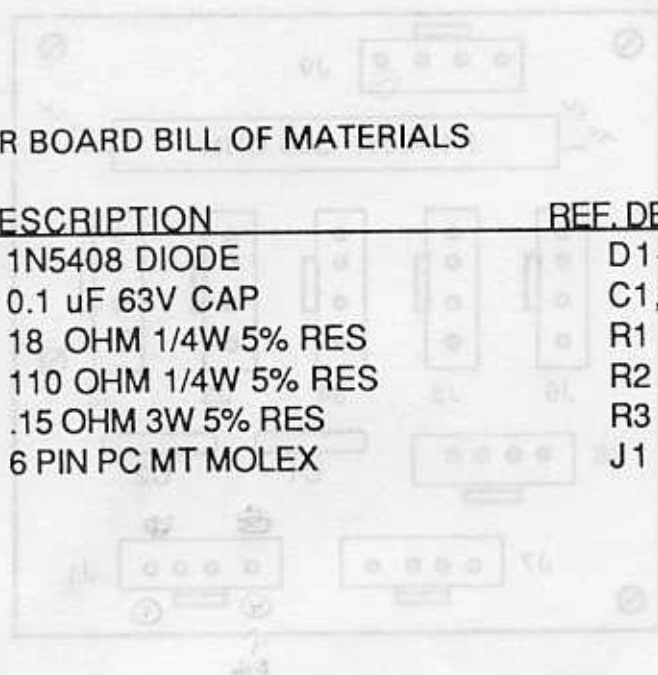
\*R3 NORMALLY OPEN

FIGURE B-3 LK450 METER BOARD



# LK450 METER BOARD BILL OF MATERIALS

| QTY | DESCRIPTION         | REF. DESIG.        |
|-----|---------------------|--------------------|
| 4   | 1N5408 DIODE        | D1-4               |
| 2   | 0.1 $\mu$ F 63V CAP | C1,2               |
| 1   | 18 OHM 1/4W 5% RES  | R1                 |
| 1   | 110 OHM 1/4W 5% RES | R2                 |
| 1   | .15 OHM 3W 5% RES   | R3 *NORMALLY OPEN* |
| 1   | 6 PIN PC MT MOLEX   | J1                 |



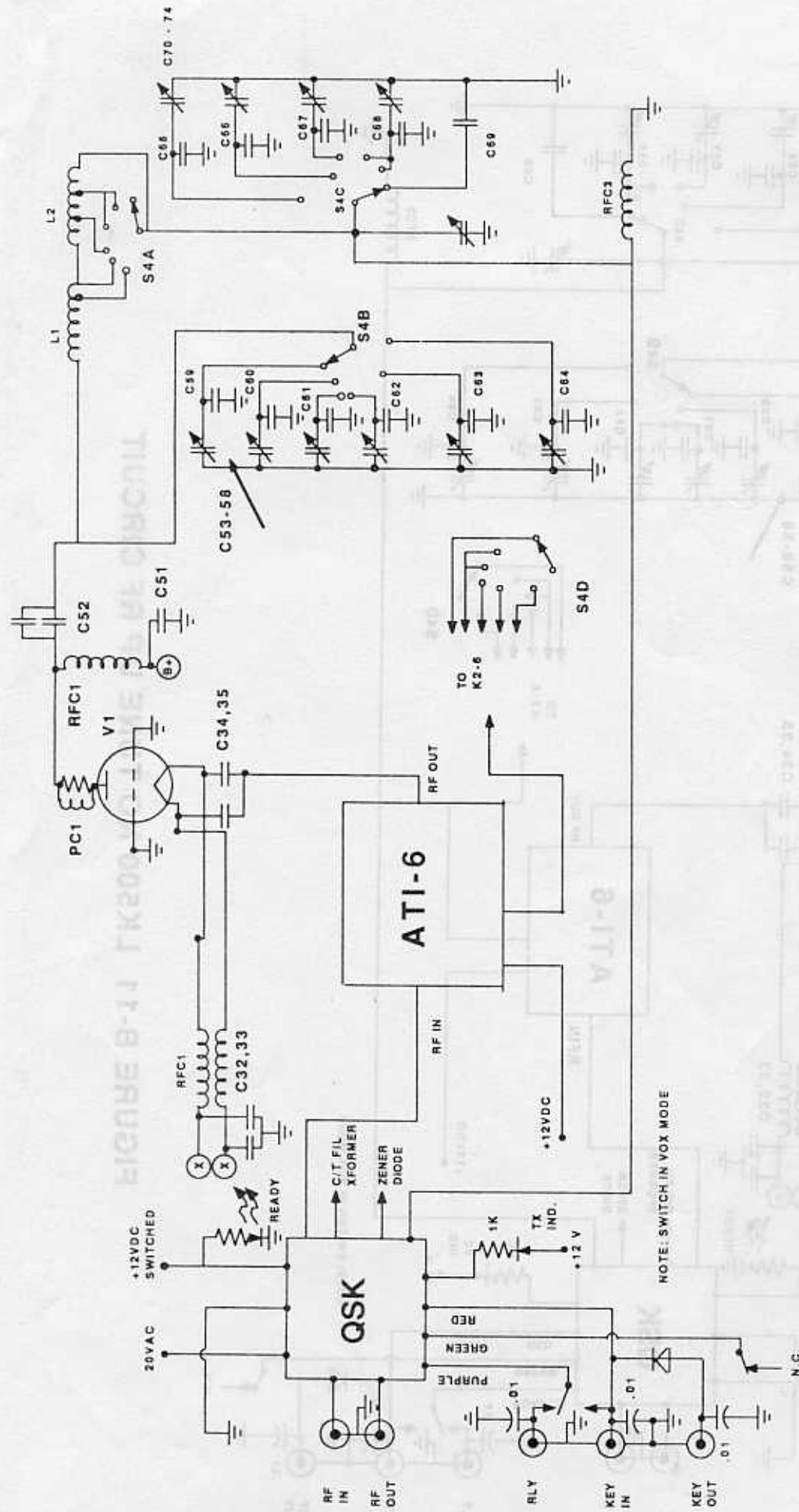


FIGURE B-10 LK450 NO TUNE UP RF CIRCUIT

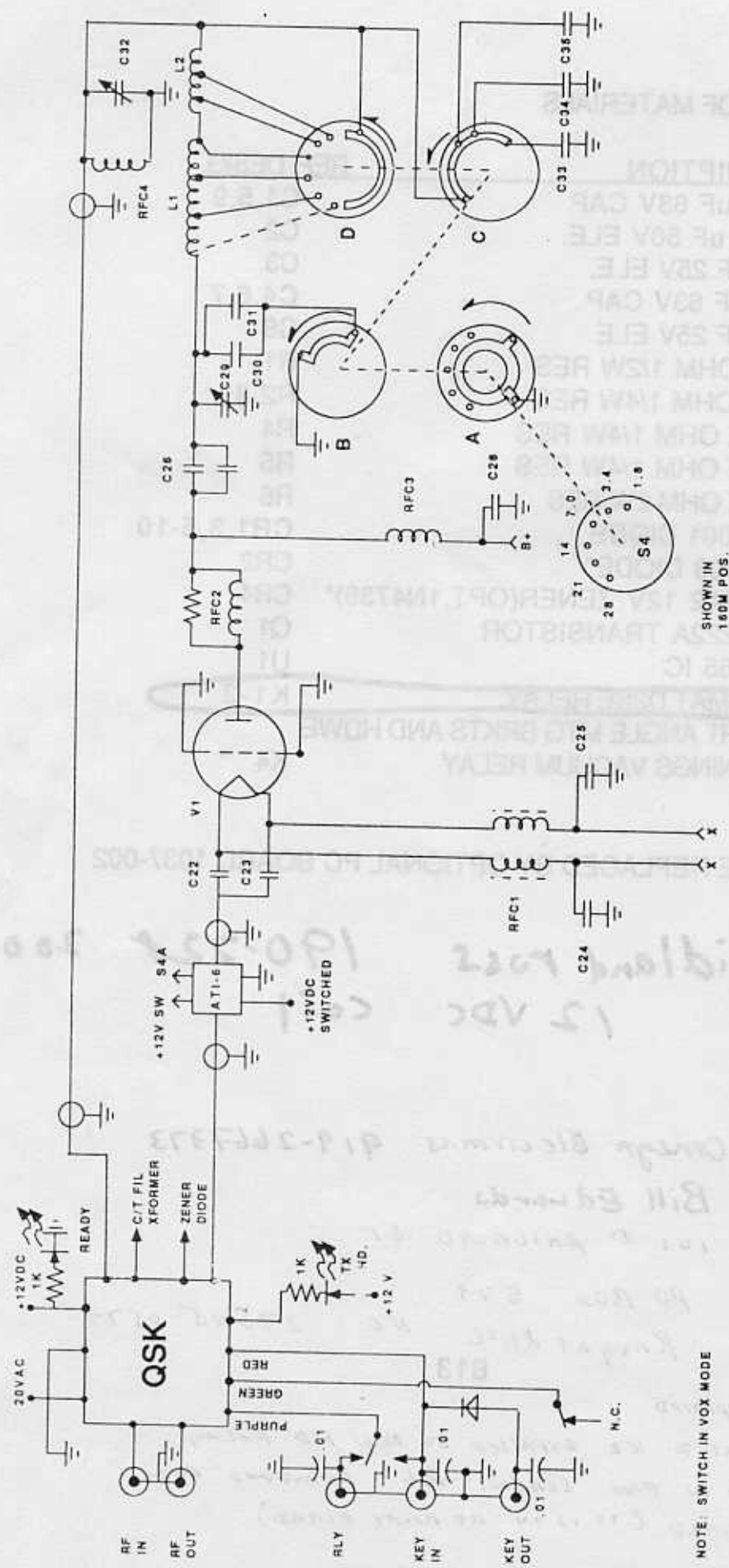


FIGURE B-7 LK450 SCHEMATIC

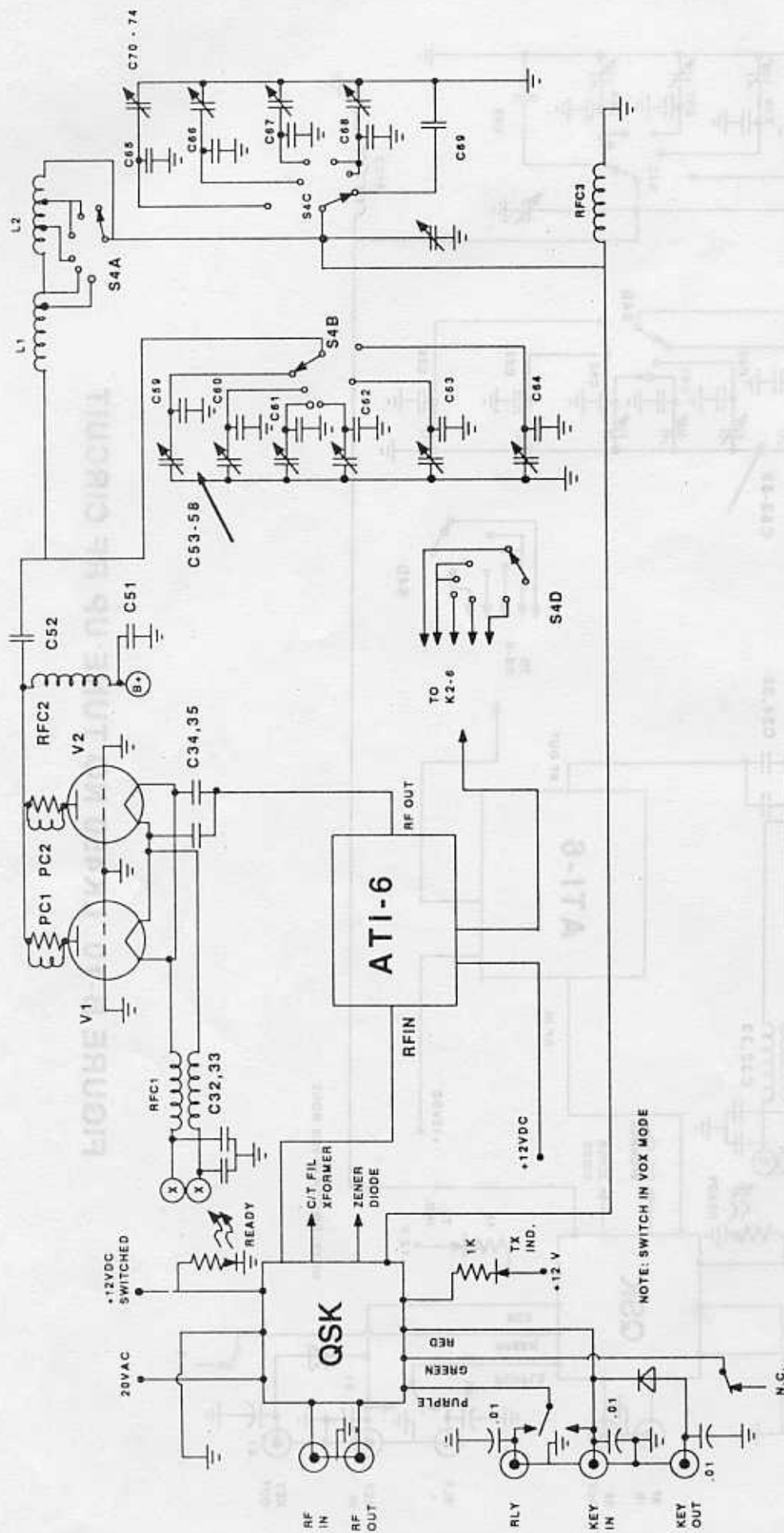


FIGURE B-11 LK500 NO TUNE UP RF CIRCUIT

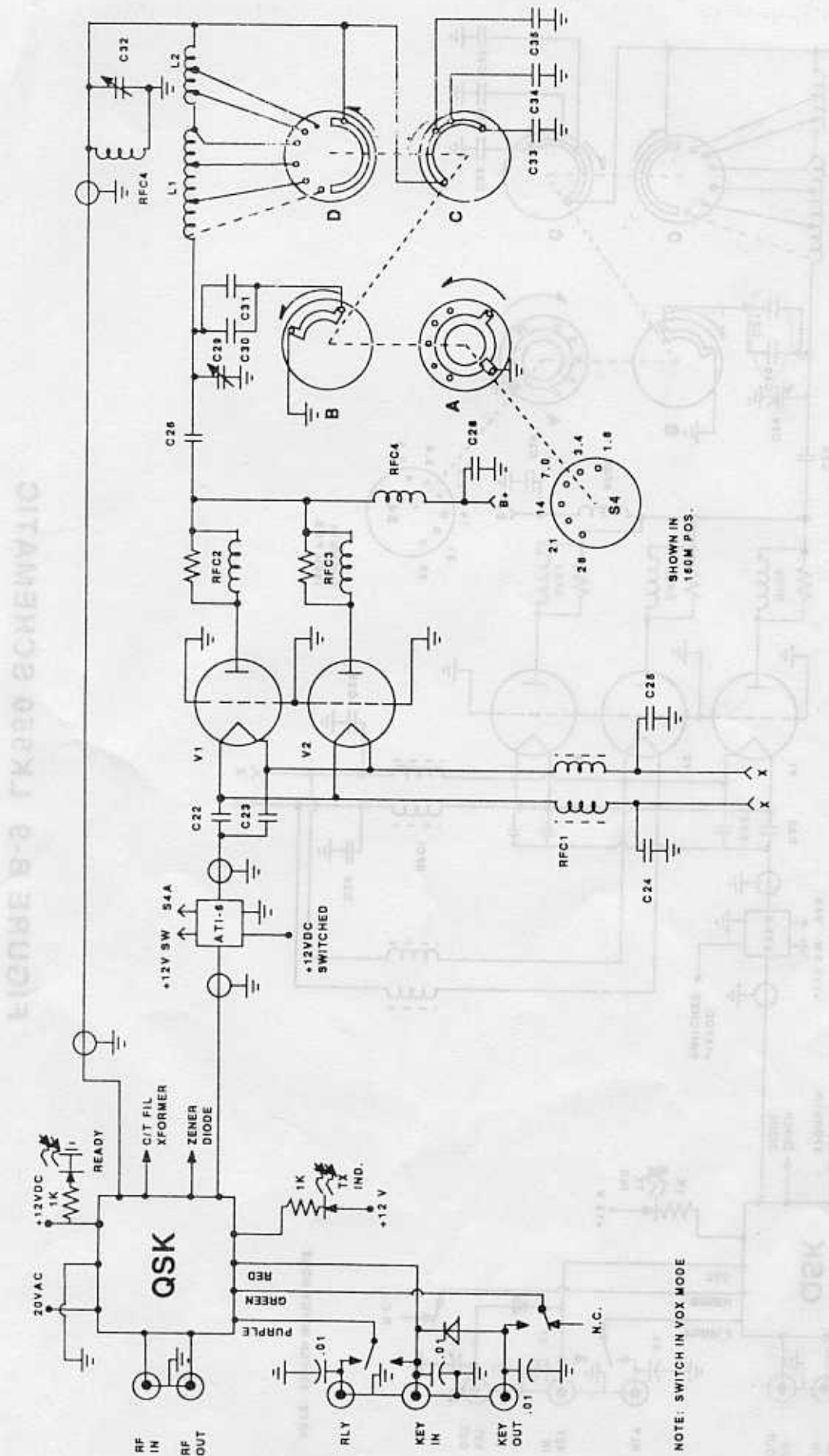


FIGURE B-8 LK500 SCHEMATIC







BILL OF MATERIALS - PA TANK CIRCUIT, REGULAR TUNE VERSIONS  
LK450-500-550 SERIES AMPLIFIERS

C22-25 .01uF 1kV disc capacitor  
 C26, 28 1000pF 5kV ceramic Teflon disc capacitor  
 C29 75-250pF 3.5kV variable Plate Tuning capacitor  
 C30-31 500pF 5kV 160M fixed Plate Tuning capacitor  
 C32 32-800pF 2.5kV variable Plate Loading capacitor  
 C33 1400pF 5kV 160M fixed Plate Loading capacitor  
 C34 940pF 5kV 80M fixed Plate Loading capacitor  
 C35 470pF 5kV 40M fixed Plate Loading capacitor  
 L1 160-40M Final Tank Coil  
 L2 20-10M Final Tank Coil  
 PC1-3 100 ohm 2W carbon resistor; 3T #16 wire parallel Parasitic  
 Suppressor  
 RFC1 30A ferrite core Filament Choke  
 RFC2 PC1000-2A Plate Choke  
 RFC3 1-2.5mH 170mA RF Choke  
 S4A-D Bandswitch, Centralab. Silver Plated contacts

\*\*\*\*\*

BILL OF MATERIALS - PA TANK CIRCUIT, NO-TUNE VERSIONS  
LK450-500-550 SERIES AMPLIFIERS

C32-35 .01uF 1kV disc capacitor  
 C51-52 1000pF 5kV ceramic Teflon disc capacitor  
 C53-58 10-50pF 3.3kV 160-15M variable Plate Tuning capacitors  
 C59-64 25-500pF 5kV ceramic Teflon disc. 160-15M fixed-value Plate  
 Tuning capacitor. Nominal value, optimized at final test  
 C65-68 470-1000pF 5kV ceramic Teflon disc. 15-80M fixed-value Plate Loading  
 capacitor. Nominal value optimized at final test  
 C69 1400pF 5kV ceramic Teflon disc. 160M fixed Plate Loading capacitor  
 C70-73 32-105pF 2.5kV 15-80M variable Plate Loading capacitor  
 C74 32-105pF 2.5kV Fine Tune capacitor  
 L1 160-40M Final Tank Coil  
 L2 20-10M Final Tank Coil  
 PC1-3 100 ohm 2W carbon resistor; 3T #16 wire parallel Parasitic  
 Suppressor  
 RFC1 30A ferrite core Filament Choke  
 RFC2 PC1000-2A Plate Choke  
 RFC3 1-2.5mH 170mA RF Choke  
 S4A-D Bandswitch, Centralab. Silver Plated contacts

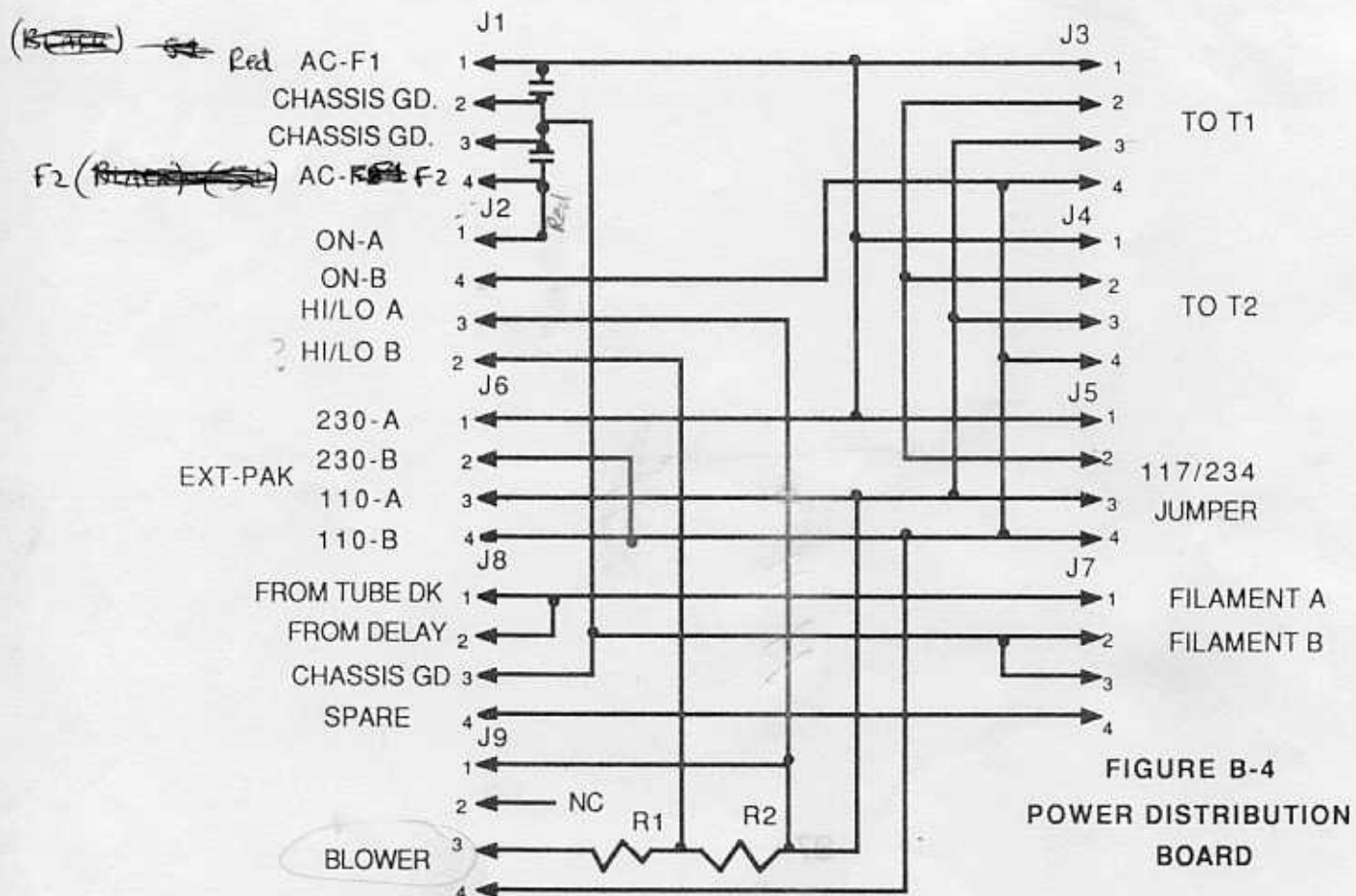
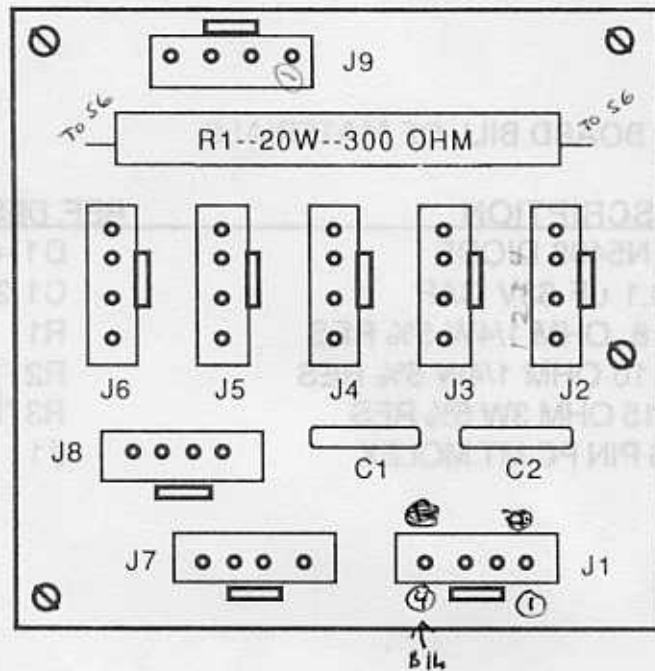


FIGURE B-4  
POWER DISTRIBUTION  
BOARD

# POWER DISTRIBUTION BOARD BILL OF MATERIALS

| QTY | DESCRIPTION                | REF. DESG. |
|-----|----------------------------|------------|
| 9   | 4 PIN PC MOUNT MOLEX CONN. | J1-9*      |
| 2   | 0.01 $\mu$ F 1KV DISC CAP  | C1,2       |
| 1   | 300 OHM 20W RES            | R1         |
| 1   | 1K OHM 10W RES             | R2**       |

\* NOTE J7,8 ONLY USED ON LK-800

\*\*NOTE R2 OPTIONAL RESISTANCE FOR VARYING COOLING FAN SPEED

- 5/19/95: — NOTE J2 IS CONNECTED TO STEP-START PROTECTION BOARD
- A SWITCH ON REAR PANEL (S6) ~~SH~~ SHORTS OUT R1 FOR HIGH-SPEED FAN
- (HI-LO SWITCH NOT INCLUDED ON THIS MODEL)

B9

# POWER SUPPLY BOARD BILL OF MATERIALS

| <u>QTY</u> | <u>DESCRIPTION</u>       | <u>REF. DESIG.</u> |
|------------|--------------------------|--------------------|
| 17         | 1N5408 DIODE             | D1-17              |
| 1          | 2200uF 25V ELECTROLYTIC  | C3                 |
| 7          | 450VDC COMP.GRADE ELECT. | C4-10              |
| 1          | .15 OHM 3W PLATE SHUNT   | R2                 |
| 1          | .15 OHM 3W GRID SHUNT    | R3                 |
| 15         | 100K OHM 2W RES          | R4-17,21           |
| 2          | 1 MEG OHM 2W 1% RES      | R18,19             |
| 1          | 1.5 MEG OHM 2W 1% RES    | R20                |
| 16         | 1 MEG OHM 1W RES         | R22-29,30-37       |

THE REMAINING COMPONENTS SHOWN IN FIG. 4, ALTHOUGH NOT PART OF THE POWER SUPPLY BOARD, WHERE INCLUDED TO HELP CLARIFY CIRCUIT OPERATION AND ARE LOCATED THROUGHOUT THE AMPLIFIER.

| <u>QTY</u> | <u>DESCRIPTION/LOCATION</u>      | <u>REF. DESIG.</u> |
|------------|----------------------------------|--------------------|
| 2          | FUSES/BACK OF CHASSIS            | F1,2               |
| 2          | 0.01 uF 1KV CAP. /POW. DIST. BD. | C1,2               |
| 1          | 300 OHM 20W RES/POW. DIST. BD.   | R1                 |
| 1          | 4 PIN PC MOLEX /POW. DIST. BD.   | J1                 |
| 1          | FILAMENT TRANSFORMER/IN AMP      | T1                 |
| 1          | POWER TRANSFORMER /IN AMP        | T2                 |
| 1          | 1N3308 ZENER DIODE /IN AMP       | D2                 |
| 1          | ANT. CHANGEOVER RELAY/QSK BD.    | K1                 |
| 1          | 0.01 uF 63V CAPACITOR /QSK BD.   | C1                 |
| 1          | 100K OHM 2W RESISTOR /QSK BD.    | R6                 |
| 4          | 1N5408 DIODE/ALO BOARD           | D1,2,5,6           |
| 1          | PLATE METER /ALO BOARD           | M1                 |
| 1          | GRID METER /ALO BOARD            | M2                 |
| 1          | 110 OHM 1/4W/ALO BOARD           | R1                 |
| 1          | 18 OHM 1/4W /ALO BOARD           | R29                |
| 1          | 0.1uF 63V CAP/ALO BOARD          | C1                 |
| 1          | 0.1uF 63V CAP/ALO BOARD          | C24                |



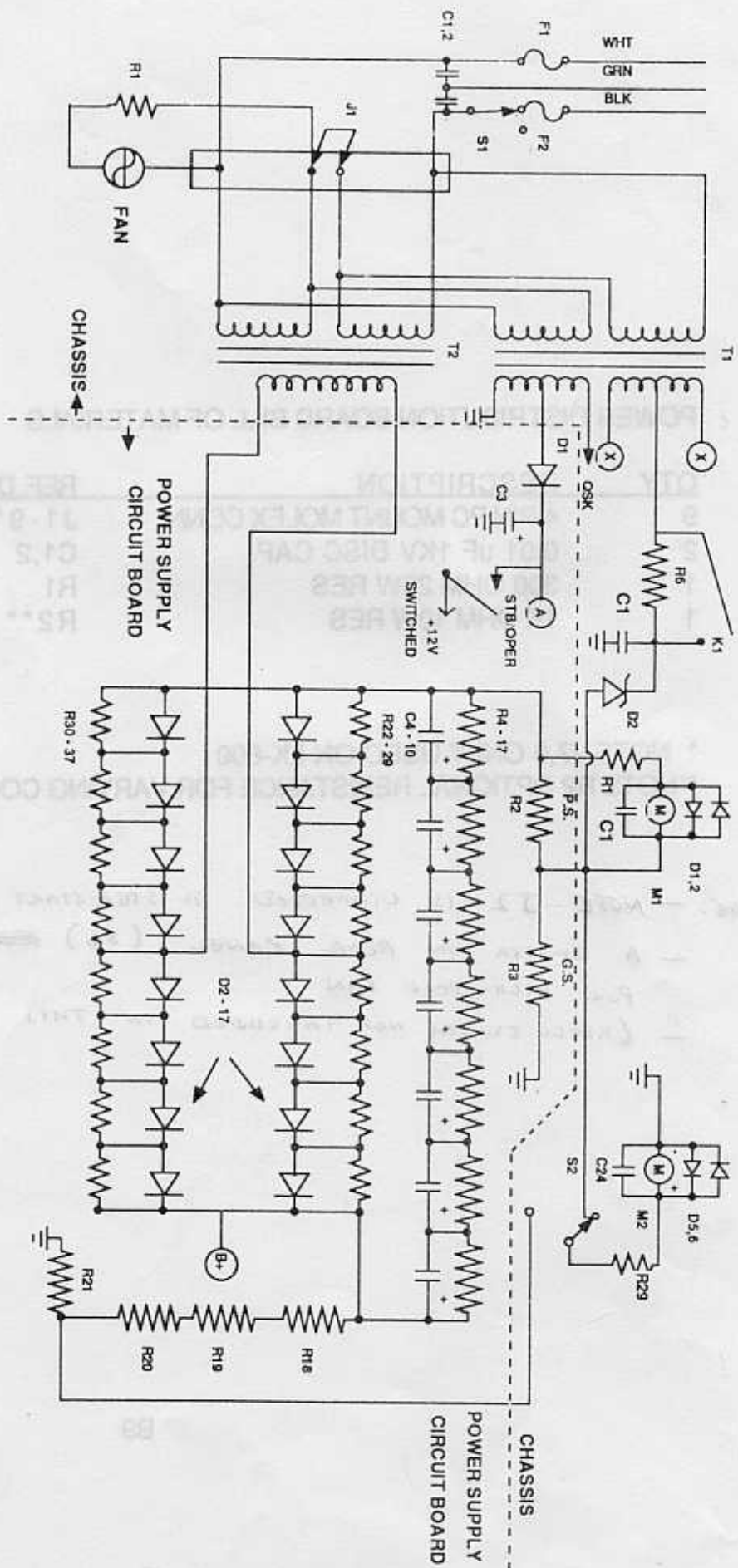


FIGURE B-5 POWER SUPPLY



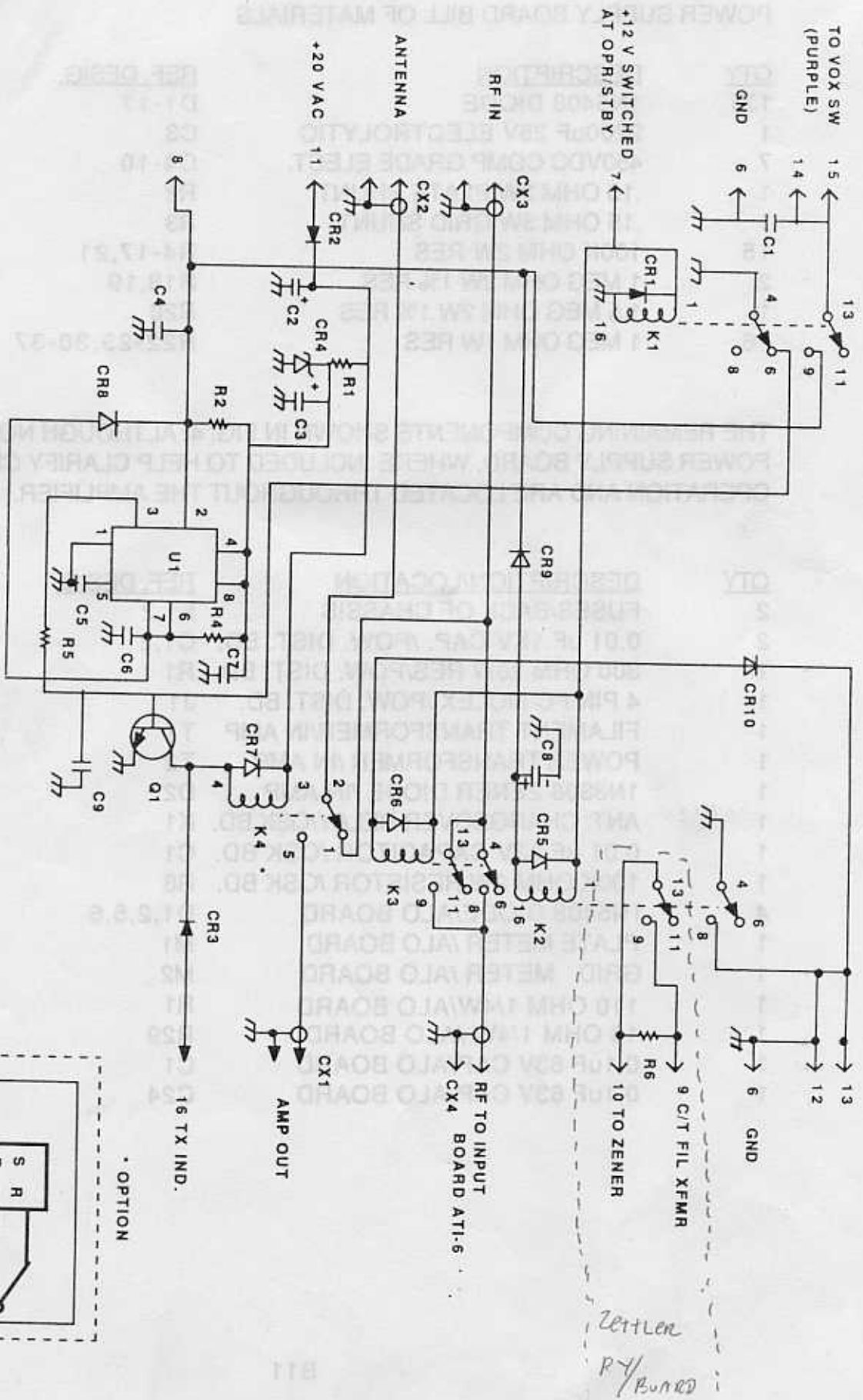


FIGURE B-6 QSK BOARD

QSK OPERATION WARNING!

QSK OPERATION WITH YOUR LK450-500-550 SERIES AMPLIFIER IS ENABLED ONLY IF YOUR KEY, KEYSER OR COMPUTER WITH PROPER INTERFACE IS PLUGGED INTO THE KEY IN JACK ON THE REAR PANEL OF YOUR AMPLIFIER, AND THE KEY OUT JACK LINE IS ROUTED TO THE TRANSCEIVER KEYING INPUT. THE QSK CIRCUITRY IN THE AMPLIFIER MUST CONTROL THE QSK FEATURES OF YOUR TRANSCEIVER. FAILURE TO OBSERVE PROPER INTERCONNECTION PROCEDURES WILL RESULT IN DAMAGE TO THE QSK SYSTEM AND WILL VOID YOUR WARRANTY.

SEPTEMBER 1, 1988

# QSK BOARD BILL OF MATERIALS

| QTY | DESCRIPTION                    | REF. DESIG. |
|-----|--------------------------------|-------------|
| 4   | 0.01 uF 63V CAP                | C1,5,9      |
| 1   | 1000 uF 50V ELE.               | C2          |
| 1   | 1.0 uF 25V ELE.                | C3          |
| 3   | 0.1 uF 63V CAP                 | C4,6,7      |
| 1   | .47uF 25V ELE                  | C8          |
| 1   | 200 OHM 1/2W RES               | R1          |
| 2   | 10K OHM 1/4W RES               | R2,3        |
| 1   | 100K OHM 1/4W RES              | R4          |
| 1   | 330K OHM 1/4W RES              | R5          |
| 1   | 100K OHM 2W RES                | R6          |
| 9   | 1N4001 DIODE                   | CR1,3,5-10  |
| 1   | 1N5408 DIODE                   | CR2         |
| 1   | 1N4742 12V ZENER(OPT.1N4739)*  | CR4         |
| 1   | 2N2222A TRANSISTOR             | Q1          |
| 1   | NE555 IC                       | U1          |
| 3   | AROMAT D2SE RELAY              | K1-3        |
| 2   | RIGHT ANGLE MTG BRKTS AND HDWE |             |
| 1   | JENNINGS VACUUM RELAY          | K4 *        |

\*NOTE K4 CAN BE REPLACED BY OPTIONAL PC BOARD 1037-002

Midland ross 190-228 200  
12 VDC coil

Omega Electronics 919-266-7373

Bill Edwards

101 D RAILROAD ST

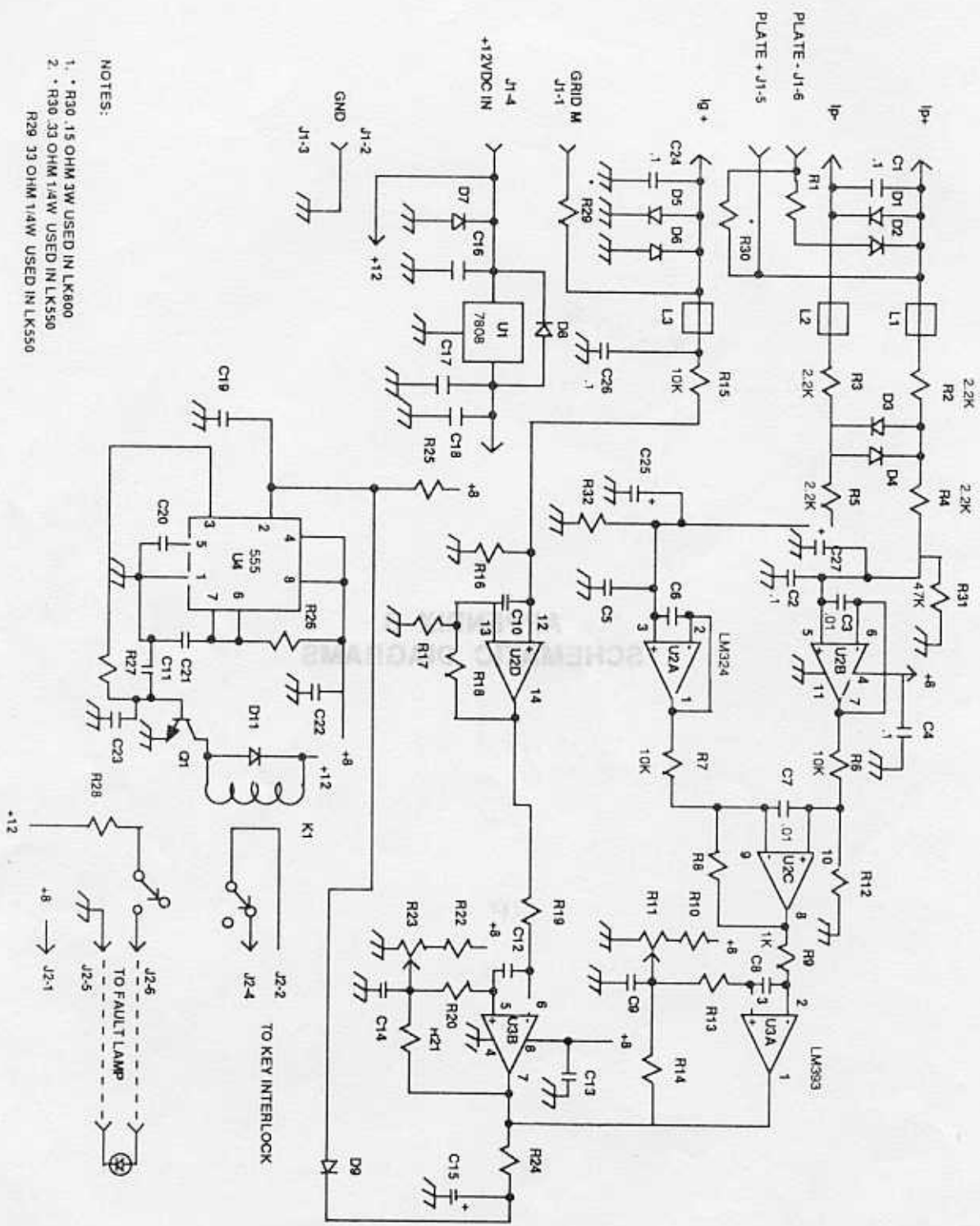
PO BOX 575

Knightdale NC 27545-0579

B13

3/94 K2 Replaced

BIAS CKT TO K2 BYPASSED TO NEW HID RELAY  
MOUNTED ON PAN SCREW. R6 REMOVED FROM  
QSK BOARD (IT IS ON HD RELAY BOARD)

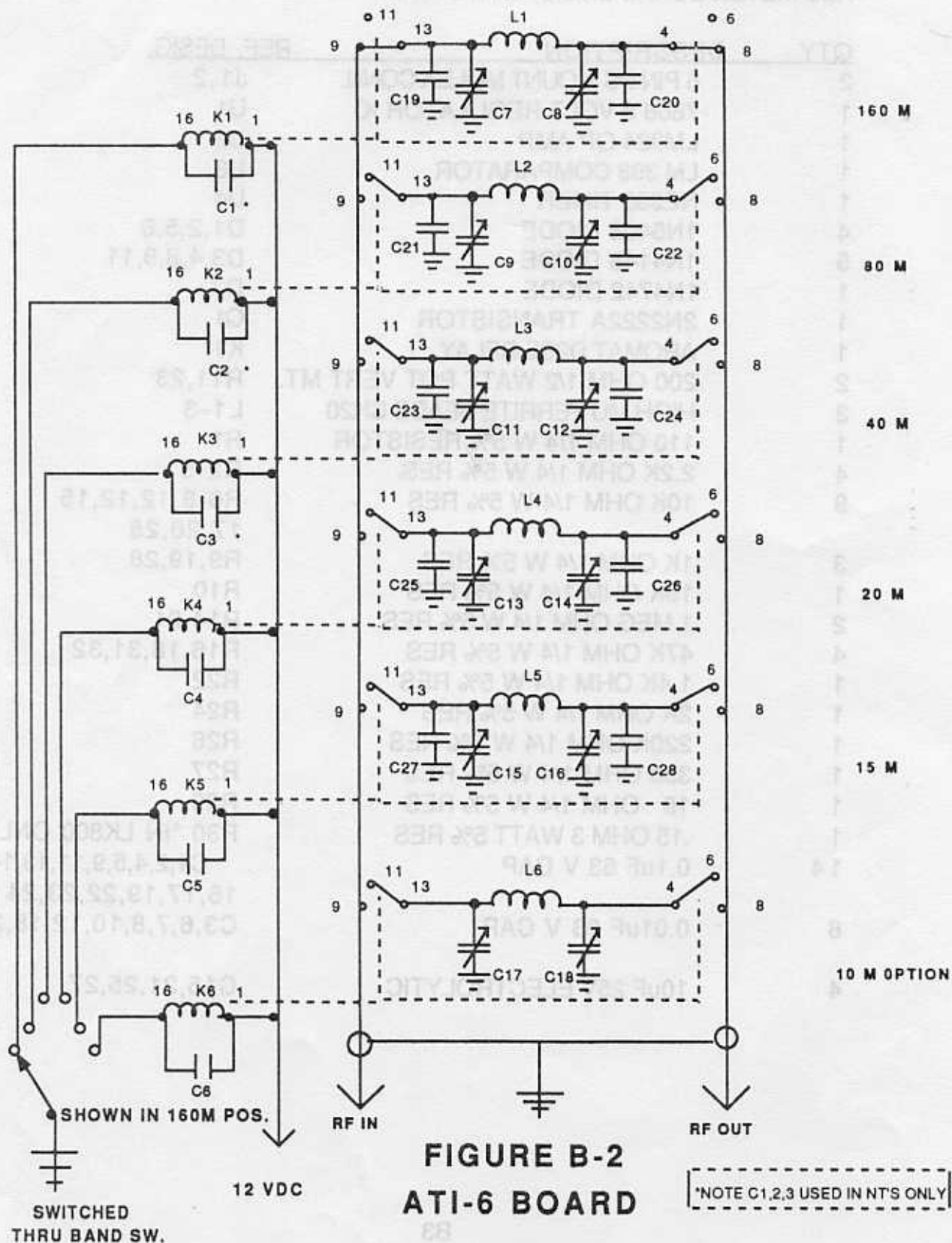


- NOTES:
- 1. \* R30 .15 OHM 3W USED IN LK600
  - 2. \* R30 .33 OHM 1/4W USED IN LK550
  - R29 .33 OHM 1/4W USED IN LK550

FIGURE B-1 ALO METER BOARD

# ALO METER BOARD BILL OF MATERIALS

| QTY | DESCRIPTION                   | REF. DESIG.                              |
|-----|-------------------------------|--|
| 2   | 6 PIN PC MOUNT MOLEX CONN.    | J1,2                                     |
| 1   | 7808 8 VOLT REGULATOR IC      | U1                                       |
| 1   | LM324 OP AMP                  | U2                                       |
| 1   | LM 393 COMPARATOR             | U3                                       |
| 1   | NE555 TIMER                   | U4                                       |
| 4   | 1N5408 DIODE                  | D1,2,5,6                                 |
| 5   | 1N4148 DIODE                  | D3,4,8,9,11                              |
| 1   | 1N4742 DIODE                  | D7                                       |
| 1   | 2N2222A TRANSISTOR            | Q1                                       |
| 1   | AROMAT D2SE RELAY             | K1                                       |
| 2   | 200 OHM 1/2 WATT POT VERT MT. | R11,23                                   |
| 3   | HIGH MU FERRITE BEADS CN20    | L1-3                                     |
| 1   | 110 OHM 1/4 W 5% RESISTOR     | R1                                       |
| 4   | 2.2K OHM 1/4 W 5% RES         | R2-5                                     |
| 9   | 10K OHM 1/4 W 5% RES          | R6-8,12,12,15<br>17,20,25                |
| 3   | 1K OHM 1/4 W 5% RES           | R9,19,28                                 |
| 1   | 15K OHM 1/4 W 5% RES          | R10                                      |
| 2   | 1 MEG OHM 1/4 W 5% RES        | R14,21                                   |
| 4   | 47K OHM 1/4 W 5% RES          | R16,18,31,32                             |
| 1   | 1.4K OHM 1/4 W 5% RES         | R22                                      |
| 1   | 2K OHM 1/4 W 5% RES           | R24                                      |
| 1   | 220K OHM 1/4 W 5% RES         | R26                                      |
| 1   | 330 OHM 1/4 W 5% RES          | R27                                      |
| 1   | 18 OHM 1/4 W 5% RES           | R29                                      |
| 1   | .15 OHM 3 WATT 5% RES         | R30 *IN LK800 ONLY*                      |
| 14  | 0.1uF 63 V CAP                | C1,2,4,5,9,11,13,14<br>16,17,19,22,23,24 |
| 8   | 0.01uF 63 V CAP               | C3,6,7,8,10,12,18,20                     |
| 4   | 10uF 25V ELECTROLYTIC         | C15,21,25,27                             |



**FIGURE B-2**  
**ATI-6 BOARD**



ADDENDUM TO LK450-500-550 SERIES AMPLIFIER OWNER'S MANUAL

- 1) Revised Instructions: Page 6 - 1.3 Front Panel Features

**F R O N T   P A N E L   C O N T R O L S**

**PWR OFF-ON** ROCKER SWITCH - Turns AC Power on and off.

**MODE XMIT-STBY** ROCKER SWITCH - Turns amplifier from Standby to Operate mode.

**METER GRID-VOLT** ROCKER SWITCH - Chooses Grid Current or Plate Voltage metering for PA Tube.

**QSK OFF-ON** ROCKER SWITCH - Enables QSK (Full Break-In CW) or VOX (PTT) mode.

\*\*\*\*\*

- 2) Revised Instructions: Page B9 - Power Distribution Board  
Bill of Materials

An important modification has now been made to all our amplifiers. Step-Start (filament current inrush) protection has been added to improve PA tube and Power Supply component life. This subchassis is mounted on standoffs directly above the Power Distribution Board. The components include a SPDT Relay (30A contacts) and a 20 ohm, 20W resistor. Upon initial power-up, the resistor is switched in series with the main AC input, and dissipates excessive current during the first quarter AC cycle, after which the relay switches the resistor out the circuit and full voltage is applied to the input of the Power Transformer.

August 12, 1988